FAI-6828311-1

UNITED STATES
DEPARTMENT OF LABOR
MINE SAFETY AND HEALTH ADMINISTRATION

REPORT OF INVESTIGATION

Surface
(Lead-Zinc Ore)

Fatal Machinery Accident
January 16, 2021

Red Dog Operations
Teck Alaska Incorporated
Kotzebue, Northwest Arctic Borough, Alaska
ID No. 50-01545

Accident Investigators

Mathew S. Johnson
Mine Safety and Health Inspector

Robert C. Wood
Supervisory Mine Safety and Health Inspector

Originating Office
Mine Safety and Health Administration
Western Region - Vacaville District
991 Nut Tree Road
Vacaville, California 95687
James M. Peck, District Manager

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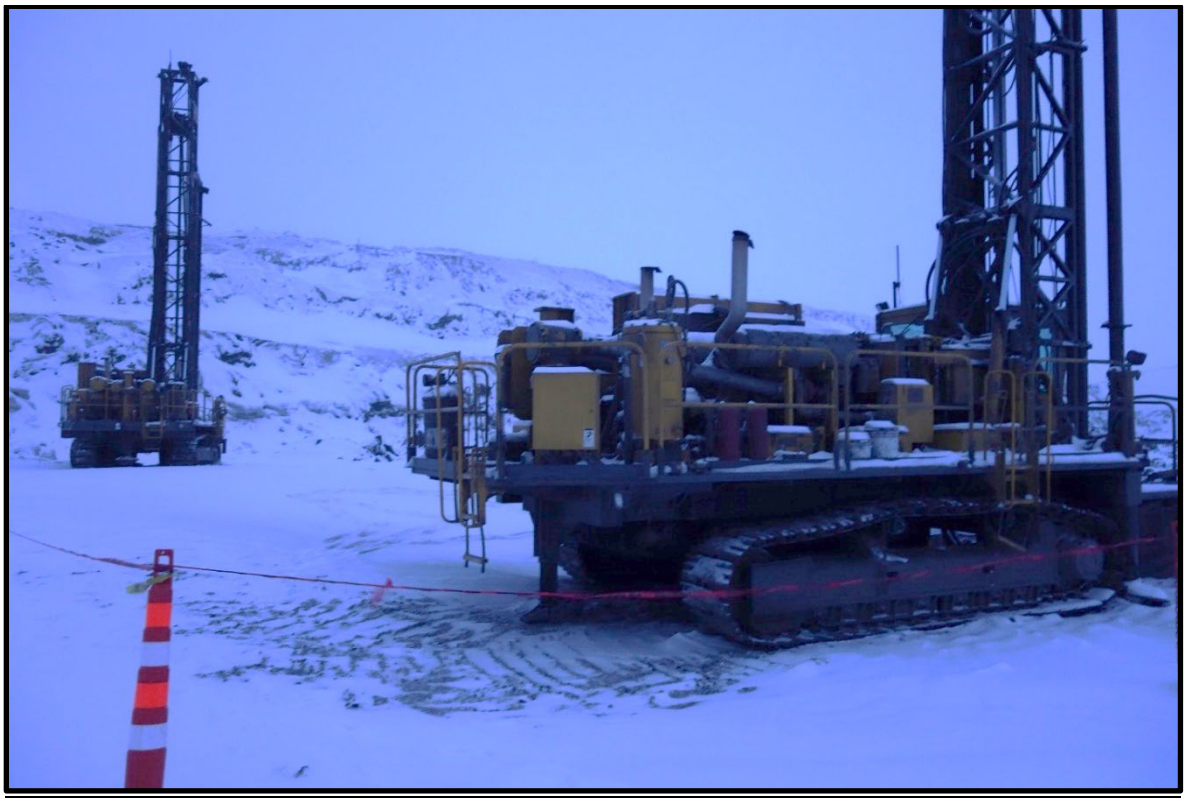

OVERVIEW

On January 16, 2021, at approximately 8:00 p.m., Dustin Thomas, a 47-year-old drill operator with seven years of mining experience, died as a result of injuries he suffered when the "J wrench" he was using to remove a down hole drill (DHD) from the drill steel moved unexpectedly, crushing his right thigh between the J wrench and the drill mast.

The accident occurred because mine management did not assure that: (1) miners working on the drill stayed clear of moving parts and machine pinch points; (2) equipment was turned off or blocked against hazardous motion while conducting maintenance activities; (3) miners followed the equipment manufacturer's written procedures for de-tooling the machine; and (4) miners were provided adequate task training for the removal of the DHD.

GENERAL INFORMATION

Teck Resources Ltd. is the parent company of Teck Alaska Inc. which owns and operates Red Dog Operations (Red Dog). Red Dog is a surface lead-zinc ore mine located near Kotzebue, Northwest Arctic Borough, Alaska and employs 251 miners. The mine operates two 12-hour shifts, seven days per week. The mine drills and blasts lead-zinc ore in an open pit. The ore is transported by haul truck to an on-site processing facility where the ore is concentrated and sent to an offsite refinery.

Principal Officers for Teck Resources Ltd. and Teck Alaska Inc. at the time of the accident were:

Don R. Lindsey	President and Chief Executive Officer, Teck Resources Ltd.
Dale Andres	President, Teck Alaska Inc.
Leslie Yesnik	General Manager, Teck Alaska Inc.
Les Panther	Treasurer, Teck Alaska Inc.

The Mine Safety and Health Administration (MSHA) completed the last regular safety and health inspection at this mine on August 24, 2020. The 2019 non-fatal days lost (NFDL) incident rate for Red Dog was 0.34, compared to the national average of 0.79 for mines of this type.

DESCRIPTION OF THE ACCIDENT

On January 16, 2021, Thomas started his shift at 7:00 p.m. by attending a pre-work meeting with the drill and blast crew. After the meeting, Thomas and Casey Buie, Driller/Blaster, traveled to the 1225 level of the Qanaiyaq Pit. Thomas moved Company Drill #40-007 away from where they were drilling on this level, and Buie began the process of separating the DHD from the drill steel of Company Drill #40-008, a process commonly referred to as "de-tooling." After parking Company Drill #40-007, Thomas traveled to Company Drill #40-008 to assist Buie with the de-tooling process.

During de-tooling, Thomas retrieved a J wrench (a specially designed wrench to fit on the backhead, which connects the DHD to the drill steel), and installed it on the wrench slots of the DHD, approximately 27 inches above the drill deck. The engine of the drill rig was running while Thomas installed the J wrench, and the DHD rapidly rotated in a counter-clockwise direction, crushing Thomas's right thigh between the J wrench and the mast of the drill. At the same time, Buie was bending down from the drill operator's seat to look for a lifting bail (a tool used to lift the DHD) when he heard a clang and Thomas scream. Buie sat up and saw Thomas's right leg caught between the J wrench and the drill mast. Buie reversed the drill steel and Thomas fell forward onto the deck and then rolled onto his back.

Buie observed blood on Thomas's insulated coveralls and called Emergency Medical Services (EMS) on the radio. Buie then made a tourniquet using a rope and tied it around Thomas's upper right thigh. EMS arrived on scene and transported Thomas to the mine's medical clinic. Resuscitative efforts were not successful, and Jim Duchenin, Physician's Assistant, in consultation with Dr. Donald Hudson in Anchorage, Alaska, pronounced Thomas dead at 9:15 p.m.

INVESTIGATION OF THE ACCIDENT

On January 16, 2021, at 9:15 p.m., Tyler Martin, Safety & Health Lead, called the Department of Labor National Contact Center (DOLNCC). The DOLNCC contacted Bart Wrobel, Supervisory Mine Safety and Health Inspector. Wrobel contacted Robert C. Wood, Supervisory Mine Safety and Health Inspector, and Wood contacted Gary Hebel, Assistant District Manager. Hebel dispatched Mathew S. Johnson, Mine Safety and Health Inspector, to the mine. At 9:45 p.m.,

Wood issued an order to the mine operator, under the provisions of 103(k) of the Federal Mine Safety and Health Act of 1977, to ensure the safety of miners and rescue personnel prior to the investigation team's arrival at the site.

Wood arrived at the mine on January 17, 2021, and began gathering information in preparation for Johnson's arrival. Johnson arrived at the mine site at 4:30 p.m. on January 18, 2021, to continue the investigation. MSHA's accident investigation team conducted a physical examination of the accident scene, interviewed miners, and reviewed conditions and work procedures relevant to the accident. See Appendix A for a list of persons who participated in the investigation.

DISCUSSION

Location of the Accident

The accident occurred on the 1225 bench of the Qanaiyaq Pit.

Equipment Involved

The drill involved in this accident is a track-mounted Atlas Copco drill (see Appendix B). The DHD is an air-driven, piston-powered device used for drilling hard rock. The manufacturer's manual states that the J wrench must be placed on the backhead so that the J wrench is slightly above the deck when being used. Investigators found the J wrench 27 inches above the deck on the backhead.

Investigators inspected the drill, observed drill function, including drill rotation, and did not find defects that contributed to the accident. The investigators were unable to replicate or determine the cause of the rapid counter-clockwise rotation.

Weather

At the time of the accident, the weather was 10 degrees Fahrenheit and partly cloudy. Investigators determined that weather was not a contributing factor in the accident.

Training and Experience

Dustin Thomas had seven years of mining experience, all at this mine. Thomas had approximately three years of experience as a driller/blaster. He received annual refresher training in 2020, in accordance with MSHA's Part 48 training regulations. He had received task training on the drill, but the training regarding de-tooling the DHD was inadequate. Red Dog Operations did not train their drill operators to place the J wrench on the backhead so that the J wrench is slightly above the drill's deck, and to remain clear of any pinch points while operating the Atlas Copco drills as stated in the manufacturer's manual.

Examinations

Constantine Lestenkof, Jr., Mine Operations Shifter, conducted a workplace examination of the 1225 bench before work commenced in this area and did not note any deficiencies.

Illumination
It was dark at the time of the accident. Work lights in the area provided adequate illumination on the drills.

Policy and Procedures
The mine operator did not have policies or procedures in place for de-tooling the DHD. The mine operator had a general standard operating procedure (SOP) in place for drill operation and removal of drill steel, but the SOP did not provide specific information for the safe removal of the DHD using the J wrench, nor did it reference the manufacturer's instructions for the procedure.

ROOT CAUSE ANALYSIS

The accident investigation team conducted an analysis to identify the underlying causes of the accident. The team identified the following root causes, and the mine operator implemented the corresponding corrective actions to prevent a recurrence.

1. Root Cause: The mine operator did not have adequate policies and procedures to ensure miners stayed clear of moving drill parts.

   Corrective Action: Red Dog Operations updated their written policies and procedures to include periodic field reviews of de-tooling and drill maintenance activities, to assure that miners stay clear of moving drill parts. The mine operator trained all miners and managers on the new policies and procedures.

2. Root Cause: The mine operator did not have policies to assure that miners turned off or blocked equipment against hazardous motion while conducting maintenance activities.

   Corrective Action: Red Dog Operations developed new written policies and procedures to include periodic field reviews of de-tooling and drill maintenance activities to ensure that miners de-energize and block equipment against hazardous motion during this activity. The mine operator trained miners and managers on the new written policies and procedures.

3. Root Cause: The mine operator did not have policies to assure miners were de-tooling the DHD within the scope of the manufacturer's instructions.

   Corrective Action: Red Dog Operations implemented a new written policy in conformance with the manufacturer's manual for de-tooling the DHD. The mine operator trained miners and managers on the new written policy, which includes placing the J wrench on the backhead so that the J wrench is slightly above the drill's deck, and remaining clear of pinch points as stated in the manufacturer's manual.

4. Root Cause: The mine operator's task training program had a deficiency that allowed inadequacies in the miners' training.

Corrective Action: Red Dog Operations revised their task training plan to require management observation of new drill operators' performance of drilling procedures, including de-tooling the DHD, during non-production sessions. If any hazardous conditions or practices are observed, management will immediately conduct re-training. The mine operator provided task training to all drill operators on how to safely operate, and de-tool, an Atlas Copco drill.

CONCLUSION

On January 16, 2021, at approximately 8:00 p.m., Dustin Thomas, a 47-year-old driller with seven years of mining experience, died as a result of injuries he suffered when the "J wrench" he was using to remove a down hole drill (DHD) from the drill steel moved unexpectedly, crushing his right thigh between the J wrench and the drill mast.

The accident occurred because mine management did not assure that: (1) miners working on the drill stayed clear of moving parts and machine pinch points; (2) equipment was turned off or blocked against hazardous motion while conducting maintenance activities; (3) miners followed the equipment manufacturer's written procedures for de-tooling the machine; and (4) miners were provided adequate task training for the removal of the DHD.

Approved By:

_____ _____

James M. Peck Date
District Manager

ENFORCEMENT ACTIONS

1. A 103(k) Order No. 7982434 was issued to Teck Alaska Inc. on January 17, 2021.

   A miner was fatally injured on drill no. 4008 on the 1200-670 pattern of the 1225 bench at 8:00 pm, and died at 9:15 pm on 1/16/2021. All persons are prohibited from entering the 1225 bench, or entering/operating drill number 4008 or 4007. This order was initially issued at 9:45 pm on 1/16/2020 by MSHA Supervisory Inspector Robert Wood, and is now being reduced to writing.

2. A 104(a) Citation was issued to Teck Alaska Inc. for violation of 30 CFR § 56.14105.

   Maintenance activity was being performed on the Atlas Copco DML HP 900 drill, Company #40-008, while the machine's power was not off, nor was it blocked against hazardous motion. On January 16, 2021, a driller died while assisting another drill operator in removing the down hole drill (DHD) from Company Drill #40-008. The driller was installing a J wrench on the DHD wrench slots when the DHD rapidly rotated in a counter-clockwise direction, crushing his right thigh between the J wrench and the drill mast. The machine power was on, and no action was taken to prevent unplanned movement of the DHD. The mine operator did not have a procedure in place for this process on the drill.

3. A 104(a) Citation was issued to Teck Alaska Inc. for a violation of 30 CFR § 48.27.

   The mine operator did not provide adequate new task training for the removal of the down hole drill (DHD) on the Atlas Copco DML HP 900 drill. On January 16, 2021, a driller died while assisting another drill operator in removing the DHD from Company Drill #40-008. The victim had installed the J wrench on the backhead approximately 27" above the deck of the drill, resulting in his right thigh being crushed between the J wrench and the drill mast when unexpected movement occurred. The operator's manual states that while installing the J wrench on the DHD that the backhead will be slightly above the deck. The operator did not have a procedure in place on the removal of the DHD during the de-tooling process.

APPENDIX A – Persons Participating in the Investigation

Red Dog Operations

Scott Leighton	Superintendent, Safety & Health
Charles Barger	Mine General Supervisor
Brendon Vermeulen	Maintenance General Supervisor
Tod Perkins	Senior Safety & Health Coordinator
Tom Farr	Port Coordinator
John Ballott	Drill and Blast Supervisor
Tyler Martin	Safety & Health Lead
Josh Arnaly	Senior Mine Engineer
Bob Chandler	Response Chief
Bill Willis	Safety & Health Officer
Constantine Lestenkof, Jr.	Mine Operations Shifter
Shawn Rangitsch	Heavy Duty Mechanic
Robert Sheldon	Heavy Duty Mechanic
Casey Buie	Driller/Blaster
Harry Kokeok	Driller/Blaster
Mike Carroll	Driller
Jim Duchenin	Physician's Assistant

Mine Safety and Health Administration

Robert C. Wood	Supervisory Mine Safety and Health Inspector
Mathew S. Johnson	Mine Safety and Health Inspector
Heather Smith	Training Specialist, Educational Field and Small Mine Services

APPENDIX B – Photographs of Company Drill #40-008